Distributed Computing Using a Raspberry Pi 2 Cluster

The Raspberry Pi is a fully functional computer about the size of a credit card costing between $20 and $35. It and other small, inexpensive computers provide a new opportunity for students and enthusiasts to learn about and work with distributed computing. Large companies such as Google, Amazon, Facebook, and many others use distributed computing to deal with the massive amounts of data that their enterprises generate. Others employ distributed computing for researching problems that are incredibly difficult such as Folding@home from Stanford which simulates the incredibly complex workings of protein folding. By acquiring a number of Raspberry Pis and connecting them via an Ethernet switch and software, a relatively inexpensive cluster can be created which provides a platform for exploration of parallelization and distributed computing. This presentation details the steps taken to create a Raspberry Pi cluster and discusses the advantages and disadvantages of such a system with respect to a more traditional setup involving standard computers in terms of capabilities, performance, cost, etc. Additionally, example applications for the cluster will be examined including implementation details and outcomes.